

September 2014,
Issue 37

Army Industrial Hygiene News and Regulatory Summary

Hazardous Substances

Special Interest Articles:

- [AEGLs](#)
- [Fume Hoods Leakage](#)
- [Facepiece Prototypes](#)
- [Hospital Ebola Waste](#)
- [OSHA Reporting](#)

Connecting Occupational Public Health and Patient Care through Electronic Health Records (EHRs)

Health IT Week recognizes efforts to improve the quality of healthcare delivery, increase patient safety, decrease medical errors, and strengthen the interaction between patients and healthcare providers via electronic health records (EHR). NIOSH is working to improve occupational safety and health through health information technology.

Read more:

<http://blogs.cdc.gov/niosh-science-blog/2014/09/17/ehr3/>



Distribution Statement A - Approved for public release; distribution unlimited.

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Direct-Reading and Sensor Technologies to Enable a New Era of Worker Safety, Health, Well-being, and Productivity



The use of sensors has increased exponentially in professional applications and in everyday life. Countless remote wireless sensors are now employed for monitoring personal health, the environment, agriculture, work sites, disaster response efforts, and “smart” buildings and facilities, to name some examples. New devices or smart phone applications are appearing

every week that promise to measure a person’s environment or health status. The availability of affordable smart phones has driven improved development of sensor technologies for all these applications. Manufacturers are developing and marketing wearable devices and even implantable devices. One example of an exciting current partnership in the occupational safety and health area, which is being funded through the NIOSH extramural grant program and developed at the University of Michigan, is a belt-worn monitor to detect volatile organic compounds.

Read more

<http://www.cdc.gov/niosh/enews/enewsV12N4.html>

AEGLs for Four More Chemicals Are Now Available

The National Academies Press has released the 18th volume of Acute Exposure Guideline Levels for Selected Airborne Chemicals, a publication that covers the



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acute exposure guideline levels (AEGLs) for four of the approximately 400 extremely hazardous substances that have been identified by EPA. AEGLs are exposure levels below which adverse health effects are not likely to occur. These threshold exposure limits are for the general public and are applicable to emergency exposures ranging from 10 minutes to eight hours.

The chemicals covered in this volume of AEGLs for Selected Airborne Chemicals include:

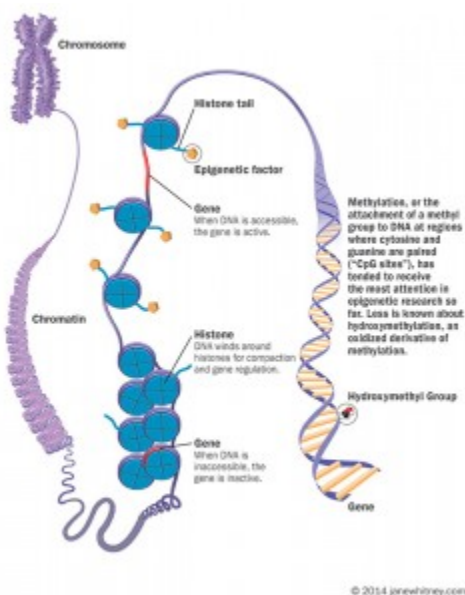
- bromine chloride
- carbonyl fluoride
- selected halogen fluorides
- oxygen difluoride

The publication is available as a free PDF on NAP's website.

Read more:

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/AEGLs-for-Four-More-Chemicals-Are-Now-Available.aspx>

Hydroxymethylation and Metals: a Potential Epigenetic Marker for Effects of Toxic Exposures



It isn't well understood how chronic low-level exposures to toxic metals contribute to disease, but a growing number of studies suggest epigenetic mechanisms may play a

role.^{1,2,3,4} In this issue of EHP, investigators report a novel association between metals exposure and DNA hydroxymethylation, an epigenetic modification that has only recently entered the research spotlight.⁵

Epigenetic modifications can influence gene expression without changing the genome sequence. DNA methylation—the addition of a methyl group, typically to a CpG site (where a cytosine base is followed by a guanine base)—is an important step for a number of cell processes, including embryonic development and maintenance of chromosomal stability.⁶ Aberrant levels of DNA methylation have been reported in association with a number of diseases.^{7,8}

Read more: <http://ehp.niehs.nih.gov/122-A251/>

Modeled Occupational Exposures to Gas-Phase Medical Laser- Generated Air Contaminants

Exposure monitoring data indicate the potential for substantive exposure to laser-generated air contaminants (LGAC); however the diversity of medical lasers and their applications limit generalization from direct workplace monitoring. Emission rates of seven previously reported gas-phase constituents of medical laser-generated air contaminants (LGAC) were determined experimentally and used in a semi-empirical two-zone model to estimate a range of plausible occupational exposures to health care staff. Single-source emission rates were generated in an emission chamber as a one-compartment mass balance model at steady-state. Clinical facility parameters such as room size and ventilation rate were based on standard ventilation and environmental conditions required for a laser surgical facility in compliance with regulatory agencies. All input variables in the model including point source emission rates were varied over an appropriate distribution in a Monte Carlo simulation to generate a range of time-weighted average (TWA) concentrations in the near and far



field zones of the room in a conservative approach inclusive of all contributing factors to inform future predictive models. The concentrations were assessed for risk and the highest values were shown to be at least three orders of magnitude lower than the relevant occupational exposure limits (OELs). Estimated values do not appear to present a significant exposure hazard within the conditions of our emission rate estimates.

Read more: Journal of Occupational and Environmental Hygiene, Volume 11, Issue 11, 2014 (Available with AIHA membership)

Multicenter Study of Environmental Contamination with Antineoplastic Drugs in 36 Canadian Hospitals: A 2013 Follow-Up Study

No occupational exposure limit exists for antineoplastic drugs. The main objective of this study was to describe environmental

contamination with cyclophosphamide, ifosfamide and methotrexate in pharmacy and patient care areas of Canadian hospitals

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in 2013. The secondary objective was to compare the 2013 environmental monitoring results with previous studies.



Workers handling hazardous drugs need protection to prevent potentially harmful exposure.

Six standardized sites in the pharmacy and six sites on patient care areas were sampled in each participating center. Samples were analyzed for the presence of cyclophosphamide, ifosfamide and methotrexate by UPLC-MSMS. The limit of detection (LOD) in pg/cm² was 1.8 for cyclophosphamide, 2.2 for ifosfamide and 8.0 for methotrexate. The 75th percentile of

cyclophosphamide concentration was compared between the 2013, 2008–2010 and 2012 studies.

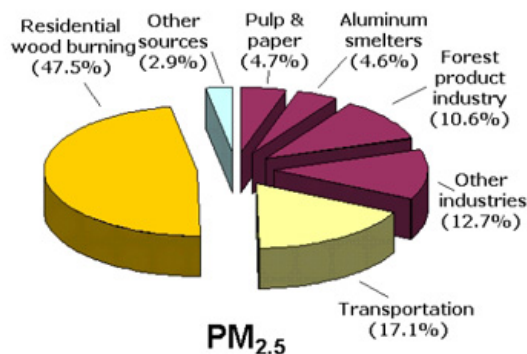
Thirty-six hospitals participated in the study and 422 samples were collected. Overall, 47% (198/422) of the samples were positive for cyclophosphamide, 18% (75/422) were positive for ifosfamide and 3% (11/422) were positive for methotrexate. In 2013, the 75th percentile value of cyclophosphamide surface concentration was reduced to 8.4pg/cm² (n = 36), compared with 9.4pg/cm² in 2012 (n = 33) and 40pg/cm² (n = 25) in 2008–2010. The 75th percentile for ifosfamide and methotrexate concentration remained lower than the LOD.

The 2013 study shows an improvement in the surface contamination level, and a plateau effect in the proportion of positive samples.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 08 Aug 2014 (Available with AIHA membership)

Assessing the Health Threat of Outdoor Air: Lung Cancer Risk of Particulate Matter Exposure

Outdoor air pollution is made up of particulate matter (PM) and hundreds of chemicals from natural sources and human-related activities.^{1,2} In October 2013 the International Agency for Research on Cancer (IARC) reviewed more than 1,000 research articles and formally designated outdoor air pollution in general and PM in



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particular as human carcinogens.³ A new meta-analysis of epidemiological research in this issue of EHP now estimates the lung cancer risk associated with PM exposure.⁴ PM includes particles of varying sizes, with the coarse (PM₁₀) and fine (PM_{2.5}) fractions attracting the most research attention.⁴ PM_{2.5} is of special interest because its size allows delivery of genotoxic chemicals deep into the lung.^{3,5} Worldwide, average outdoor air concentrations of PM

vary from less than 10 µg/m³ to more than 100 µg/m³, but most studies have been undertaken in North America and Europe, which have relatively low PM levels (10–30 µg/m³) compared with those in developing countries.^{1,2}

Read more: <http://ehp.niehs.nih.gov/122-A252/>

Acute Effects of Carcinogens



We tend to think of chemicals that cause cancer as doing so over a relatively extended period of time.

Indeed, the exposure metric used for evaluating this risk by the EPA is often the Lifetime Average Daily Dose (LADD). Specifically, we are told in an EPA document on the subject of pesticide risk assessment: <http://www.epa.gov/scipoly/sap/meetings/1998/march/chapd-2.pdf> that:

“...If the endpoint is cancer, the [Average Daily Dose] ADD must be amortized over

the duration of a lifetime using the calculation for a [Lifetime Average Daily Dose](LADD). An equation that can be used to calculate LADD values is presented below:

$$\text{LADD} = \text{ADD} * (\text{F}/365) * (\text{ED}/\text{LT})$$

Where:

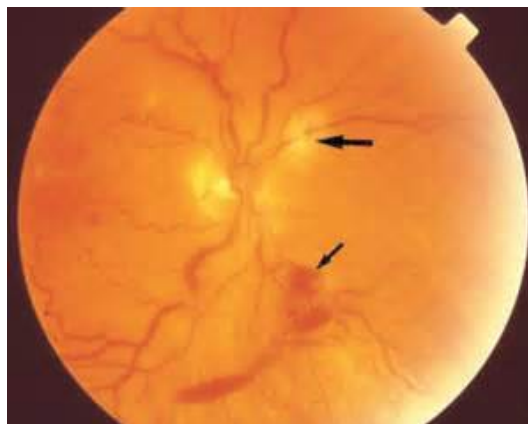
- LADD = ADD amortized over an individual's lifetime (e.g., mg/kg/day);
- F = frequency of exposure events or the number of days exposed to the pesticide of concern per annum (days/year);
- ED = exposure duration throughout a lifetime or the number of years exposed to a specific chemical throughout an individual's lifetime (years); and
- LT = anticipated lifetime of an individual in the exposed population of interest (years...)”

Read more: <http://jayiock-associates.blogspot.com/2014/09/acute-effects-of-carcinogens.html>

Radiation

Replacing Effective Spectral Radiance by Temperature in Occupational Exposure Limits to Protect Against Retinal Thermal Injury from Light and Near IR Radiation

Exposure to visible light and near infrared (NIR) radiation in the wavelength region of 380 to 1400 nm may cause thermal retinal injury. In this analysis, the effective spectral radiance of a hot source is replaced by its temperature in the exposure limit values in the region of 380–1400 nm. This article describes the development and implementation of a computer code to predict those temperatures, corresponding to the exposure limits proposed by the American Conference of Governmental Industrial Hygienists (ACGIH®). Viewing duration and apparent diameter of the source were inputs for the computer code. At the first stage, an infinite series was created for calculation of spectral radiance by integration with Planck's law. At the second stage for calculation of effective spectral radiance, the initial terms of this infinite series were selected and integration was performed by multiplying these terms by a weighting factor $R(\lambda)$ in the wavelength region 380–1400 nm. At the third stage, using a computer code, the source temperature that can emit the same effective spectral radiance was found. As a



result, based only on measuring the source temperature and accounting for the exposure time and the apparent diameter of the source, it is possible to decide whether the exposure to visible and NIR in any 8-hr workday is permissible. The substitution of source temperature for effective spectral radiance provides a convenient way to evaluate exposure to visible light and NIR.

Read more: Journal of Occupational and Environmental Hygiene Volume 11, Issue 10, 2014 (Available with AIHA membership)

Cause of New Mexico Nuclear Waste Accident Remains a Mystery

A 55-gallon drum of nuclear waste, buried in a salt shaft 2,150 feet under the New Mexico desert, violently erupted late on

Feb. 14 and spewed mounds of radioactive white foam.

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A The flowing mass, looking like whipped cream but laced with plutonium, went airborne, traveled up a ventilation duct to the surface and delivered low-level radiation doses to 21 workers.

The accident contaminated the nation's only dump for nuclear weapons waste — previously a focus of pride for the Energy Department — and gave the nation's elite ranks of nuclear chemists a mystery they still cannot unravel.

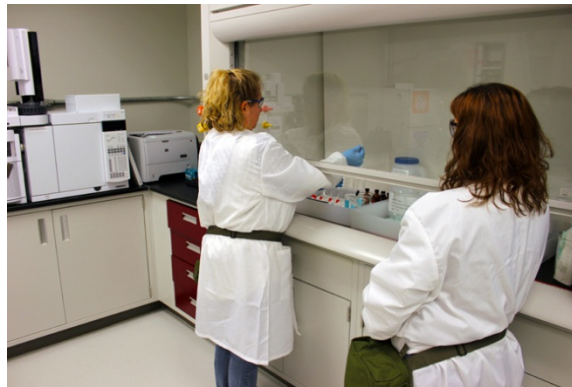
Read more:

<http://www.latimes.com/nation/la-na-nuclear-waste-accident-20140824-story.html#page=1>

Ventilation

Evaluation of Leakage from Fume Hoods Using Tracer Gas, Tracer Nanoparticles and Nanopowder Handling Test Methodologies

The most commonly reported control used to minimize workplace exposures to nanomaterials is the chemical fume hood. Studies have shown, however, that significant releases of nanoparticles can occur when materials are handled inside fume hoods. This study evaluated the performance of a new commercially available nano fume hood using three different test protocols. Tracer gas, tracer nanoparticle, and nanopowder handling protocols were used to evaluate the hood. A static test procedure using tracer gas (sulfur hexafluoride) and nanoparticles as well as an active test using an operator handling nanoalumina were conducted. A commercially available particle generator was used to produce sodium chloride tracer nanoparticles. Containment effectiveness



was evaluated by sampling both in the breathing zone (BZ) of a mannequin and operator as well as across the hood opening. These containment tests were conducted across a range of hood face velocities (60, 80, and 100 ft/min) and with the room ventilation system turned off and on. For the tracer gas and tracer

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nanoparticle tests, leakage was much more prominent on the left side of the hood (closest to the room supply air diffuser) although some leakage was noted on the right side and in the BZ sample locations. During the tracer gas and tracer nanoparticle tests, leakage was primarily noted when the room air conditioner was on for both the low and medium hood exhaust airflows. When the room air conditioner was turned off, the static tracer gas tests showed good containment across most test conditions. The tracer gas and nanoparticle test results were well correlated showing hood leakage under the same conditions and at the same sample

locations. The impact of a room air conditioner was demonstrated with containment being adversely impacted during the use of room air ventilation. The tracer nanoparticle approach is a simple method requiring minimal setup and instrumentation. However, the method requires the reduction in background concentrations to allow for increased sensitivity.

Read more *Journal of Occupational and Environmental Hygiene* Volume 11, Issue 10, 2014 (Available with AIHA membership)

ASHRAE Proposes Alternate Compliance Path in IAQ Standard



An alternate compliance path for existing buildings is one of six proposed addenda to ANSI/ASHRAE Standard 62.1-2013, Ventilation for Acceptable Indoor Air Quality, open for public comment until Oct. 5.

Read more: <http://hvac.com/iaq-ventilation/ashrae-proposes-alternate-compliance-path-iaq-standard>

Vortex Ventilation in the Laboratory Environment

Assured containment at low airflow has long eluded the users of ventilated enclosures including chemical fume hoods used throughout industry. It is proposed that containment will be enhanced in a hood that has a particular interior shape that causes a natural vortex to occur. The

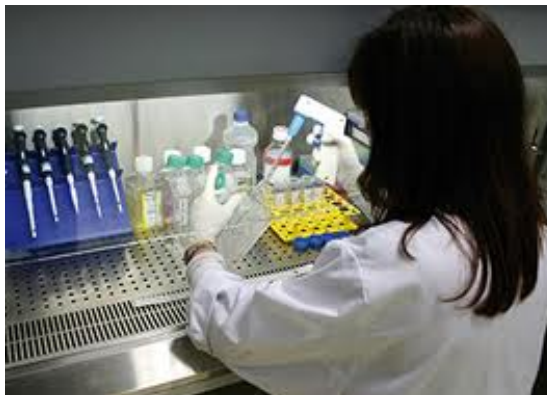
sustained vortex improves the containment of contaminants within the enclosure at low airflow. This hypothesis was tested using the ASHRAE 110 tracer gas test. A known volume of tracer gas was emitted in the hood. A MIRAN SapphIRe infrared spectrometer was used to measure the

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concentration of tracer gas that escapes the enclosure. The design of the experiment included a written operating procedure, data collection plan, and statistical analysis of the data.

A chemical fume hood of traditional design was tested. The hood interior was then reconstructed to enhance the development of a vortex inside the enclosure. The hood was retested using the same method to compare the performance of the traditional interior shape with the enhanced vortex shape. In every aspect, the vortex hood showed significant improvement over the traditional hood design. Use of the Hood Index characterizing the dilution of gas in an air stream as a logarithmic function indicates a causal relationship between containment and volumetric airflow

through an enclosure. Use of the vortex effect for ventilated enclosures can provide better protection for the user and lower operating cost for the owner.



Read more: Journal of Occupational and Environmental Hygiene Volume 11, Issue 10, 2014 (Available with AIHA membership)

PPE

NIOSH Issues First Closed-Circuit Escape Respirator Approval under New Certification Requirements



NIOSH has issued the first approval for a respirator that complies with the new requirements for closed-circuit escape respirators (CCERs). The approval comes approximately nine months ahead of the deadline established for companies to transition to the new requirements. The new requirements are intended to strengthen emergency respiratory protection for workers relying on these devices during life-threatening escape situation.

Read more:

<http://www.cdc.gov/niosh/enews/enewsV12N4.html#i>

Changes in Chemical Permeation of Disposable Latex, Nitrile, and Vinyl Gloves Exposed to Simulated Movement

Glove movement can affect chemical permeation of organic compounds through polymer glove products. However, conflicting reports make it difficult to compare the effects of movement on chemical permeation through commonly available glove types. The aim of this study was to evaluate the effect of movement on chemical permeation of an organic solvent through disposable latex, nitrile, and vinyl gloves. Simulated whole-glove permeation testing was conducted using ethyl alcohol and a previously designed permeation test system. With exposure to movement, a significant decrease ($p \leq 0.001$) in breakthrough time (BT) was observed for the latex (-23%) and nitrile gloves (-31%). With exposure to movement, only the nitrile glove exhibited a significant increase ($p \leq 0.001$) in steady-state permeation rate (+47%) and cumulative permeation at 30 min (+111%). Even though the nitrile glove provided optimum chemical resistance against ethyl alcohol, it was most affected by movement. With exposure to movement, the latex glove was an equivalent option for overall worker protection, because it was less affected by movement and the permeation rate was lower than that of the nitrile glove. In contrast, the vinyl glove was the least affected by movement, but did not provide



adequate chemical resistance to ethyl alcohol in comparison with the nitrile and latex gloves. Glove selection should take movement and polymer type into account. Some glove polymer types are less affected by movement, most notably the latex glove in this test. With nitrile gloves, at least a factor of three should be used when attempting to assign a protection factor when repetitive hand motions are anticipated. Ultimately, the latex gloves outperformed nitrile and vinyl in these tests, which evaluated the effect of movement on chemical permeation. Future research should aim to resolve some of the observed discrepancies in test results with latex and vinyl gloves.

*Read more: Journal of Occupational and
Environmental Hygiene Volume 11, Issue 11,*

2014 (Available with AIHA membership)

A Novel Method for Designing and Fabricating Low-Cost Facepiece Prototypes



In 2010, NIOSH published new digital head form models based on their recently updated fit-test panel. The new panel, based on the 2000 census to better represent the modern work force, created two additional sizes: Short/Wide and Long/Narrow. While collecting the anthropometric data that comprised the panel, additional three-dimensional data were collected on a subset of the subjects. Within each sizing category, five individuals' three-dimensional data were used to create the new head form models. While NIOSH has recommended a switch to a five-size system for designing respirators, little has been done in assessing the potential

benefits of this change. With commercially available elastomeric facepieces available in only three or four size systems, it was necessary to develop the facepieces to enable testing. This study aims to develop a method for designing and fabricating elastomeric facepieces tailored to the new head form designs for use in fit-testing studies. This novel method used computed tomography of a solid silicone facepiece and a number of computer-aided design programs (VolView, ParaView, MEGG3D, and RapidForm XOR) to develop a facepiece model to accommodate the Short/Wide head form. The generated model was given a physical form by means of three-dimensional printing using stereolithography (SLA). The printed model was then used to create a silicone mold from which elastomeric prototypes can be cast. The prototype facepieces were cast in two types of silicone for use in future fit-testing.

*Read more: Journal of Occupational and
Environmental Hygiene Volume 11, Issue 10,
2014 (Available with AIHA membership)*

Noise

Alternative for Hearing Aid Listening Stethoscope

UFE Electronic Designs, Laguna Hills, Calif, has announced a new hearing aid evaluation tool for audiologists and hearing instrument specialists (patent pending).

According to the company, when a clinician listens to a hearing aid through a stethoscope-type listening tool, the high frequency information is lost, and a distorted frequency response is created by the long listening tube. UFE has developed the AcousticEar™ electronic amplifier designed to replace these types of devices. It reportedly includes an adjustable volume control, a hands-free holder for RIC, BTE, and custom aids, dual mini-earbuds, battery, and instructions.



Read more

<http://www.hearingreview.com/2014/09/alternative-hearing-aid-stethoscope-offered-ufo-electronic-design/>

Fish, Fatty Acid Consumption Associated With Lower Risk of Hearing Loss in Women



Researchers at Brigham and Women's Hospital found that consumption of two or

more servings of fish per week was associated with a lower risk of hearing loss in women. Findings of the new study Fish and Fatty Acid Consumption and Hearing Loss study led by Sharon G. Curhan, MD, BWH Channing Division of Network Medicine, are published online on September 10 in the American Journal of Clinical Nutrition (AJCN).

Read more:

<http://www.sciencedaily.com/releases/2014/09/140910132526.htm>

Preventive Medicine

White House Launches Major Effort against Resistant Bacteria

The White House launched an ambitious multipronged attack on antibiotic-resistant bacteria that includes an executive order, a national strategy, and a detailed report from the President's Council of Advisors on Science and Technology (PCAST).

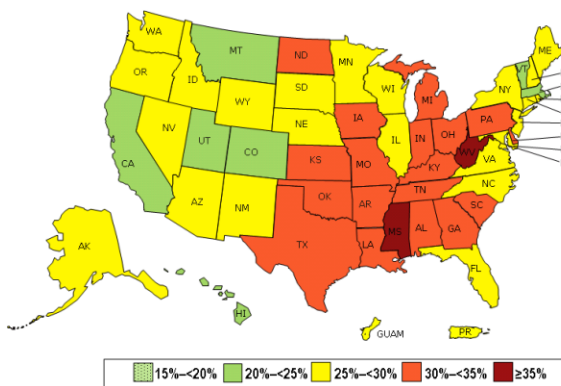
Federal agencies also announced a \$20 million prize to speed the development of a rapid diagnostic test to be used by healthcare workers to identify highly resistant bacterial infections.



Read more:

<http://www.cidrap.umn.edu/news-perspective/2014/09/white-house-launches-major-effort-against-resistant-bacteria>

Obesity Prevalence Maps



In 2013, prevalence of adults with obesity remained high based on self-reported height and weight, with state estimates ranging from 21.3 % in Colorado to 35.1 % in Mississippi and West Virginia. Seven states - California, Colorado, Hawaii,

Massachusetts, Montana, Utah, and Vermont – and the District of Columbia had an obesity prevalence of less than 25 %. Twenty states – Alabama, Arkansas, Delaware, Georgia, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas and West Virginia had an obesity prevalence of 30 % or more. The highest prevalence of obesity was in the South (30.2 %) and the Midwest (30.1 %) followed by the Northeast (26.5 %) and the West (24.9 %).

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Read more:

<http://www.cdc.gov/media/releases/2014/>

a0904-obesity-map.html

Melanoma Risk Is Higher for Flight Crews that Work at 40,000 Feet

Attention pilots and flight attendants: For your safety, please fasten your seat belts, note the location of the aircraft's emergency exits -- and be sure to apply plenty of sunscreen to reduce your risk of melanoma.

When it comes to the risks of flying, skin cancer may not be the first health hazard that comes to mind. But a new study in JAMA Dermatology says that pilots are 2.22 times more likely than folks in the general population at large to be diagnosed with melanoma. For members of the cabin crew, the risk was 2.09 times greater.

w/la-sci-sn-melanoma-risk-pilots-flight-crews-20140903-story.html



Read more:

<http://www.latimes.com/science/scienceno>

EPA Proposes Changing Standards on Pesticides and Farm Workers



The U.S. EPA has proposed stricter requirements to avoid exposure to pesticides on farms, leaving farmers and officials divided about whether they go too far or provide needed protection.

The EPA has proposed to change the Worker Protection Standards related to pesticide handlers and field workers who may be exposed to chemicals. Major provisions include:

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- Requiring handlers and field workers to be trained about pesticides annually instead of every five years.
- Adding new qualifications to consider a certified trainer.
- Requiring farmers to keep records of training provided and chemicals sprayed for two years.
- Requiring posted warning signs if entry to an area needs to be restricted for more than 48 hours after it is applied.
- Setting a minimum age of 16 to handle pesticides or work in fields where they

recently were applied, except on family farms.

- Requiring employers to provide information and transportation to an emergency facility within 30 minutes of exposure. The rule specifies they don't have to arrive within 30 minutes."

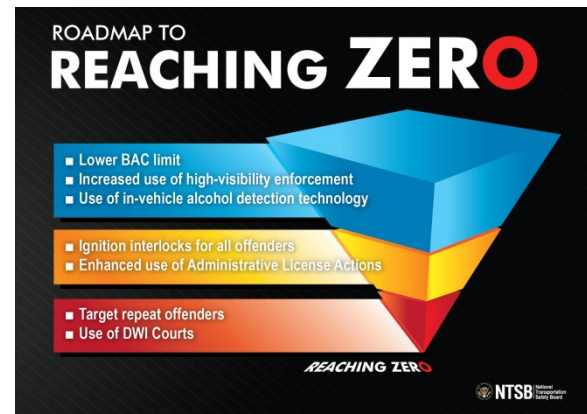
Read more:

<http://www.sej.org/headlines/epa-proposes-changing-standards-pesticides-and-farm-workers>

The National Transportation Safety Board Seeks Lower Alcohol Limits, Finds Support from ASSE

In the past several decades, awareness of the dangers of alcohol-impaired driving has increased. However, alcohol-impaired driving still accounts for approximately one-third of all U.S. highway fatalities.

Public and private entities focusing on this safety issue have changed social perceptions concerning alcohol-impaired driving; they also have achieved important legislative actions to help reduce it. Due to these efforts, the number of lives lost annually in alcohol-impaired-driver-related crashes declined 53 %, from 21,113 in 1982 to 9,878 in 2011; and the percentage of highway fatalities resulting from alcohol-involved crashes is down from 48 % in 1982 to about 31 % today.

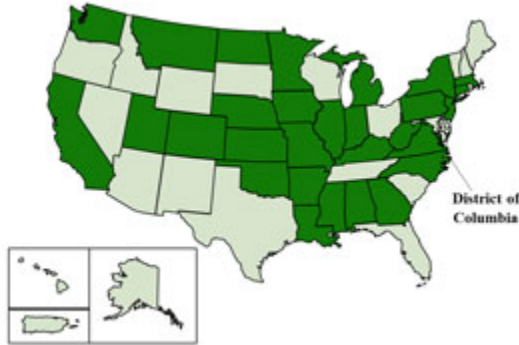


Read more:

<http://ehstoday.com/safety/national-transportation-safety-board-seeks-lower-alcohol-limits-finds-support-asse>

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What Is Enterovirus 68, The Mysterious Illness That Is Sickening Hundreds Of Children?



There have now been 153 confirmed cases in 18 states of a respiratory illness that has sent scores of children to emergency rooms and, in some cases, even to intensive care units.

Cases have now been confirmed in Minnesota and New Jersey, the Centers for Disease Control and Prevention said Thursday. Public health officials had previously confirmed cases in Alabama, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Missouri, Montana, Nebraska, Oklahoma, Pennsylvania, New York and Virginia.

Read more:


<http://www.washingtonpost.com/news/to-your-health/wp/2014/09/08/what-is-enterovirus-68-the-mysterious-illness-that-is-sickening-hundreds-of-children/>

US Hospitals Unprepared to Handle Ebola Waste

U.S. hospitals may be unprepared to safely dispose of the infectious waste generated by any Ebola virus disease patient to arrive unannounced in the country, potentially putting the wider community at risk, biosafety experts said.

Waste management companies are refusing to haul away the soiled sheets and virus-spattered protective gear associated with treating the disease, citing federal guidelines that require Ebola-related waste to be handled in special packaging by people with hazardous materials training, infectious disease and biosafety experts told Reuters.

BIOHAZARD RED BAG WASTE



Fluid blood
Blood-saturated items
Bags and IV tubing
containing blood products
Suction canisters
Hemovacs
Chest drainage units
Hemodialysis products

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Read more:

<http://www.foxnews.com/health/2014/09/>

[24/us-hospitals-unprepared-to-handle-ebola-waste/](http://www.foxnews.com/health/2014/09/24/us-hospitals-unprepared-to-handle-ebola-waste/)

Environmental Health

Departments of the Navy, Energy and Agriculture Invest in Construction of Three Biorefineries to Produce Drop-In Biofuel for Military



As part of a 2011 Presidential directive, the Departments of Navy, Energy, and Agriculture announced that three companies have been awarded contracts to construct and commission biorefineries

capable of producing “drop-in” biofuels to meet the transportation needs of the military and private sector. Made through the Department of Defense’s (DOD) Defense Protection Act (DPA) of 1950, the awards support the Administration’s goals to boost and diversify the domestic fuel supply base, make American warfighters less beholden to volatile oil markets, and strengthen national security.

Read more:

<http://energy.gov/articles/departments-navy-energy-and-agriculture-invest-construction-three-biorefineries-produce>

Pesticide Levels in Waterways Have Dropped, Reducing the Risks to Humans

In conjunction with Executive Order 13650 - The development of safer pesticides and legal restrictions on their use have sharply reduced the risk to humans from pesticide-tainted rivers and streams, while the potential risk to aquatic life in urban waters has risen, according to a two-decade survey published on Thursday.



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The study, conducted by the United States Geological Survey and published in the journal Environmental Science & Technology, monitored scores of pesticides from 1992 to 2011 at more than 200 sampling points on rivers and streams. In both of the last two decades, researchers reported, they found insecticides and herbicides in virtually all of the waterways.

Read more:

<http://www.nytimes.com/2014/09/12/us/pesticide-levels-in-waterways-have-dropped-reducing-the-risks-to-humans.html?ref=health>

Ergonomics

Contagious Dual & Large Monitor Neck Syndrome



There is quite a conundrum office workers and IT purchasers are facing these days, and they may not even know it! Here it is:

The latest monitor set-up (dual and/or large monitors) with resulting neck pain

vs.

Smaller monitor set-up with no neck pain

User & Buyer Beware

In our practice, we are finding more and more ergonomic problems associated with the trend of providing dual monitors and/or really large monitors – and particularly dual large monitors. These set-ups are actually hurting the necks and eyes of the people who use them.

Why, you ask? It comes down to our visual system. There are natural and comfortable viewing angles from our eye sockets that allow our eyes to see up/down and side to side. Beyond those comfortable viewing angles, we move our heads to see. (We don't have those really cool reptilian eyes yet.)

Read more:

<http://ohsonline.com/blogs/the-ohs-wire/2014/07/contagious-dual-large-monitor-neck-syndrome.aspx>

Subjective Evaluation of Physical and Mental Workload Interactions across Different Muscle Groups

Both physical and mental demands, and their interactions, have shown to increase biomechanical loading and physiological reactivity, as well as impair task performance. Because these interactions have shown to be muscle-dependent, the aim of this study was to determine the sensitivity of the NASA Task Load Index (NASA TLX) and Ratings of Perceived Exertion (RPE) to evaluate physical and mental workload during muscle-specific tasks. Twenty-four participants performed upper extremity and low back exertions at three physical workload levels in the absence and presence of a mental stressor. Outcome measures included RPE and NASA TLX (six sub-scales) ratings. The findings indicate that while both RPEs and NASA TLX ratings were sensitive to muscle-specific changes in physical demand, only additional mental stressor and its interaction with either physical demand or muscle groups influenced the effort sub-scale and overall workload scores of the NASA TLX. While



additional investigations in actual work settings are warranted, the NASA TLX shows promise in evaluating perceived workload that is sensitive not only to physical and mental demands but also sensitive in determining workload for tasks that employ different muscle groups.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 15 Jul 2014 (Available with AIHA membership)

Safety

President Obama Signs Executive Order Requiring Potential Federal Contractors to Disclose Labor Law Violations



On July 31, President Obama signed an executive order that requires companies competing for federal contracts to disclose labor law violations and gives agencies more guidance on how to consider labor violations when awarding federal contracts.

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The new process is designed to level the playing field and bring more companies into compliance with OSHA regulations and other workplace laws.

Read more:

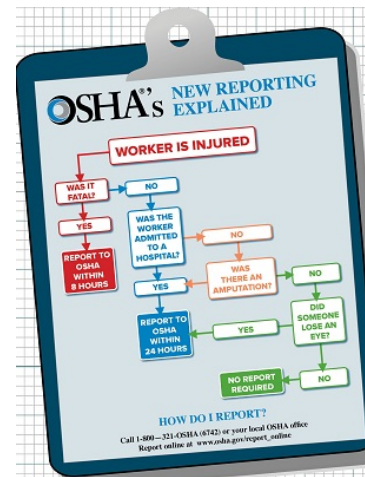
<https://www.osha.gov/as/opa/quicktakes/qt081514.html#6>

OSHA Expands Requirement for Reporting Fatalities and Severe Injuries and Updates the List of Industries Exempt from Recordkeeping Requirements

A final rule announced Sept. 11 requires employers to notify OSHA when an employee is killed on the job or suffers a work-related hospitalization, amputation or loss of an eye. The rule, which also updates the list of employers partially exempt from OSHA record-keeping requirements, will go into effect on Jan. 1, 2015 for workplaces under federal OSHA jurisdiction.

Read more:

<https://www.osha.gov/as/opa/quicktakes/qt091514.html#1>



Federal Agencies Are Lagging in Addressing Physical and Psychological Violence in the Workplace



Every week, the major media and the trade press have stories on physical and/or psychological violence in the workplace.

After 43 years in the federal government and 12 years studying workplace violence, I wanted to know whether federal departments were planning for workplace physical and psychological violence.

The U.S. Office of Personnel Management (OPM) issued guidance about planning for physical and psychological violence in the workplace to federal agencies this in 1998, but I have questions if those agencies have

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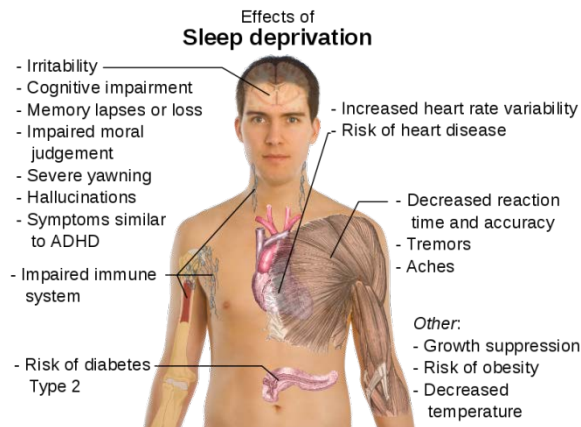
done anything to comply with the guidance in the 16 years since it was released.

[agencies-are-lagging-addressing-physical-and-psychological-violence-workplace](#)

Read more:

<http://ehstoday.com/blog/federal->

Shift Workers: Evidence for Sleep-Inducing and Alertness Drugs Is Weak



Shift workers are taking drugs to help them stay awake or get to sleep despite weak evidence for their benefit, according to a new Cochrane review. The authors of the review found only small numbers of trials testing over-the-counter and prescription drugs used by shift workers, and the results suggest that for some people they might do more harm than good.

In most developed countries, at least 10% of the workforce is involved in some form of shift work. European statistics suggest that as many as three quarters of the population have 'non-standard' working hours. Disturbances to normal sleeping and waking patterns increase the risk of accidents and affect shift workers' health. It is therefore important to avoid shift work where possible and improve shift work schedules to help shift workers achieve more normal sleeping and waking patterns. In jobs where shift work cannot be avoided, such as health care, the police force or the military, drugs can potentially offer short-term benefits.

Read more:

<http://www.sciencedaily.com/releases/2014/08/140812235745.htm>

OSHA Issues Citations for Inadequate Workplace Violence Safeguards at Two New York Facilities: Rikers Island and Brookdale University Hospital

In two separate cases, OSHA cited New York medical care providers for failing to protect workers from workplace violence and

assault. One case involved Corizon Health Inc., which provides medical, dental and psychiatric services to inmates at the Rikers

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Island correctional facility in New York City. A second case involved Brookdale University Hospital and Medical Center in Brooklyn.

The agency's Manhattan Area Office initiated the Corizon inspection in response to a complaint. OSHA found that workplace violence incidents involving Corizon employees at Rikers increased from eight in 2011 to 39 in 2013, and six incidents occurred during the course of OSHA's investigation. These included threats, physical assault, a Corizon employee locked in a cell by an inmate and the circulation of a hit list of Corizon staffers targeted by inmates.



Read more:

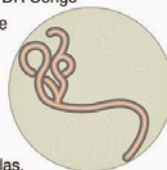
<https://www.osha.gov/as/opa/quicktakes/qt081514.html#3>

Health Workers Need Optimal Respiratory Protection for Ebola

Ebola

One of the deadliest viruses known to man

- First identified in 1976 in DR Congo
- Five known species of the virus, 3 are particularly dangerous
- Fruit bats of the *Pteropodidae* family considered the natural host of the virus
- Also documented in gorillas, chimpanzees, antelope, porcupines



Ebola haemorrhagic fever

Symptoms:

Early stage

Sudden onset of fever, intense weakness, muscle pain, headache, sore throat

Followed by...

Vomiting, diarrhoea, rash, impaired kidney and liver, internal and external bleeding

Exposure

- From direct contact with infected blood, faeces, sweat
 - Sexual contact with infected person
 - Unprotected handling of contaminated corpses
 - Handling of contaminated objects
- Incubation period 2 - 21 days

**Around 1,850 cases diagnosed since discovery
1,200 people have died**

Source: WHO

AFP

outbreaks of infectious diseases like Ebola. The correct type and level of personal protective equipment (PPE) ensures that healthcare workers remain healthy throughout an outbreak—and with the current rapidly expanding Ebola outbreak in West Africa, it's imperative to favor more conservative measures.

Read more:

<http://www.cidrap.umn.edu/news-perspective/2014/09/commentary-health-workers-need-optimal-respiratory-protection-ebola>

Healthcare workers play a very important role in the successful containment of

America's Safest Companies

America's SAFEST COMPANIES

EHS Today is proud to announce the 2014 class of America's Safest Companies. The 18 companies on the list represent a broad array of industries, from construction to retail to manufacturing to commercial diving and more. They don't focus on numbers, they focus on the importance of all workers returning home safely at the

end of the shift and do whatever it takes to make that happen.

The America's Safest Companies Class of 2014 is: The AES Corp., Alan Shintani Inc., Aqueos Corp., BL Harbert International LLC, The Charles Stark Draper Laboratory Inc., Dressbarn, Egan Co., Field Fastener, Goodwill Industries of Upstate/Mid-lands South Carolina, Inteva Products LLC, Kirk Erectors Inc., Orica USA Inc., Rockwell Automation Inc., SBM Site Services LLC, Scot Forge Co., TP Mechanical, Watermark and Westar Energy Inc.

Read more: <http://ehstoday.com/safety-leadership/america-s-safest-companies-safety-brings-you-home>

Emergency Preparedness & Response

Residential Delivery of Medical Countermeasures Using School Buses

Points of dispensing (PODs) sites located in schools or community buildings are a standard part of preparing to provide medication or vaccine to the public during an infectious disease outbreak or bioterrorist attack. Push methods – ways to get antibiotics or other forms of treatments to people's residences – are less common, yet may offer significant benefits in terms of social distancing, traffic control, and personal comfort during an emergency.



The Chesapeake Health Department (CHD) in southeastern Virginia serves a population

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of approximately 225,000 people, many of whom live in residential areas of the city. As part of a Cities Readiness Initiative (CRI) program, emergency planners developed a strategy to deliver antibiotic kits to all residences within the city limits during an emergency. CRI guidelines require a method designed to ensure access to

medical countermeasures for city residents within 48 hours of a bioterrorist attack.

Read more:

<http://www.cidrap.umn.edu/practice/residential-delivery-medical-countermeasures-using-school-buses>

America's PrepareAthon!



America's PrepareAthon! is an opportunity for individuals, organizations, and communities to prepare for specific hazards through drills, group discussions, and exercises.

National PrepareAthon! Day is September 30, 2014 and will revolve around taking the

actions to prepare for these six specific hazards:

- Earthquake
- Flood
- Hurricane
- Tornado
- Wildfire
- Winter Storm

Read more:

<http://www.community.fema.gov/connect.ti/AmericasPrepareathon/view?objectId=3222352&exp=e1>

Deployment Health

Chemical-Biological Researchers Deliver Results

Choking, watering eyes, blistering skin and convulsions are symptoms of imminent death from a chemical weapons attack. The lethality of such attacks, most recently in August 2013, in Syria, sends tremors across the globe.



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For Soldiers, chemical weapons present a real danger on the battlefield that requires advanced technology to keep them safe. The Army is investing in science and technology to enable Soldiers to operate in a chemical-biological threat environment.

Scientists and researchers at the U.S. Army Edgewood Chemical Biological Center work to provide better protective equipment, such as the iconic protective mask. As

threats evolve, ECBC engineers fielded the next-generation M50 mask to Soldiers stationed in Japan and Korea. The Army is fielding more than one million of these masks across the Department of Defense.

Read more:

http://www.army.mil/article/133570/Chemical_biological_researchers_deliver_results/

Keeping It Clean -- Natick's Self-Cleaning Fabric Technology Goes Commercial



Quoc Truong, a physical scientist at the Natick Soldier Research, Development and Engineering Center, or NSRDEC, is making sure that it all comes out before the wash.

Truong provided technical guidance and direction to NSRDEC's industry partner, Luna Innovations, Inc., to successfully

develop a durable, "omniphobic" coating used to produce self-cleaning fabrics. The technology, which was developed for use in Soldier clothing, has now made its way to the commercial market.

The coating greatly reduces how often Soldiers need to clean their clothes and enhances chem-bio protection. The omniphobic-coated fabric significantly lowers dirt and dust attraction, and repels water, oil and many liquid chemicals.

Read more:

http://www.army.mil/article/133846/Keeping_it_clean_Natick_s_self_cleaning_fabric_technology_goes_commercial/

Body Sensors to Help Soldiers in Future Conflicts

The Army is researching physiological sensors that may help Soldiers achieve superior performance on battlefields of the

future, said the commanding general of Fort Detrick, Maryland.

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Lt. Gen. Joseph Carvalho Jr., commander of the U.S. Army Medical Research and Materiel Command and Fort Detrick, led a panel discussion at the Association of the United States Army's Medical Hot Topics Forum, Sept. 10. The panel was titled "The Future of Human Performance."

The Soldiers of 2025 might have sensors that help them detect and prevent threats such as dehydration, elevated blood pressure and cognitive delays from lack of sleep, he said. Sensors might also detect external threats such as chemical exposure or extreme environment.



Read more:

http://www.army.mil/article/133577/Body_sensors_to_help_Soldiers_in_future_conflicts/

Nanotechnology

Characterizing Adoption of Precautionary Risk Management Guidance for Nanomaterials, an Emerging Occupational Hazard



Exposure to engineered nanomaterials (substances with at least one dimension of 1-100 nm) has been of increased interest, with the recent growth in production and use of nanomaterials worldwide. Various organizations have recommended methods

to minimize exposure to engineered nanomaterials. The purpose of this study was to evaluate available data to examine the extent to which studied U.S. companies (which represent a small fraction of all companies using certain forms of engineered nanomaterials) follow the guidelines for reducing occupational exposures to engineered nanomaterials that have been issued by the National Institute for Occupational Safety and Health (NIOSH) and other organizations. Survey data, field reports, and field notes for all NIOSH nanomaterial exposure assessments conducted between 2006 and 2011 were collected and reviewed to: (1) determine

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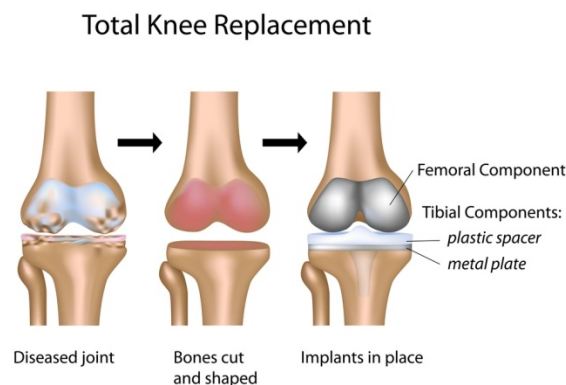
the level of adoption of precautionary guidance on engineering controls and personal protective equipment, and (2) evaluate the reliability of companies' self-reported use of engineering controls and personal protective equipment. Use of personal protective equipment was observed among 89% [95% confidence interval (CI): 76%-96%] of 46 visited companies, and use of containment-based engineering controls for at least some processes was observed among 83% (95% CI: 76%-96%). In on-site evaluations, more than 90% of the 16 engineered carbonaceous nanomaterial companies that responded to an industrywide survey were observed to be using engineering controls

and personal protective equipment as reported or more stringently than reported. Since personal protective equipment use was slightly more prevalent than engineering controls, better communication may be necessary to reinforce the importance of the hierarchy of controls. These findings may also be useful in conducting exposure assessment and epidemiologic research among U.S. workers handling nanomaterials.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 05 Aug 2014 (Available with AIHA membership)

EC and SCENIHR Begin Public Consultation on Preliminary Opinion on Guidance on the Determination of Potential Health Effects of Nanomaterials Used in Medical Devices

The European Commission (EC) and the Scientific Committee on Emerging Newly Identified Health Risks (SCENIHR) have begun a public consultation on the preliminary opinion concerning "Guidance on the Determination of Potential Health Effects of Nanomaterials Used in Medical Devices." The aim of the opinion is to address the use of nanomaterials in medical devices and to provide information for risk assessors regarding specific aspects that need to be considered in the safety evaluation of nanomaterials. Guidance is provided on physico-chemical characterization of nanomaterials, the determination of hazards associated with the use of nanomaterials, and risk assessment for the use of nanomaterials in



medical devices. The safety evaluation of nanomaterials used in medical devices is discussed in the context of the general framework for biological evaluation of medical devices as described in the International Organization for

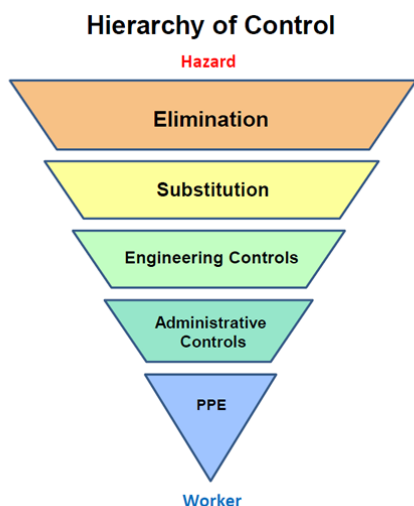
Standardization (ISO) 10993-30 1:2009 standard.

Read more :

<http://nanotech.lawbc.com/2014/07/article/s/international/ec-and-scenihhr-begin->

[public-consultation-on-preliminary-opinion-on-guidance-on-the-determination-of-potential-health-effects-of-nanomaterials-used-in-medical-devices/](#)

Exposure Controls for Nanomaterials at Three Manufacturing Sites



Because nanomaterials are thought to be more biologically active than their larger parent compounds, careful control of exposures to nanomaterials is recommended. Field studies were conducted at three sites to develop information about the effectiveness of control measures including process changes, a downflow room, a ventilated enclosure, and an enclosed reactor. Aerosol mass and number concentrations were measured during specific operations with a photometer and an electrical mobility particle sizer to provide concentration measurements across a broad range of sizes (from 5.6 nm to 30 μm). At site A, the dust exposure and during product harvesting

was eliminated by implementing a wait time of 30 minutes following process completion. And, the dust exposure attributed to process tank cleaning was reduced from 0.7 to 0.2 mg/m^3 by operating the available process ventilation during this task. At site B, a ventilated enclosure was used to control dust generated by the manual weigh-out and manipulation of powdered nanomaterials inside of a downflow room. Dust exposures were at room background (under 0.04 mg/m^3 and 500 particles/ cm^3) during these tasks however, manipulations conducted outside of the enclosure were correlated with a transient increase in concentration measured at the source. At site C, a digitally controlled reactor was used to produce aligned carbon nanotubes. This reactor was a closed system and the ventilation functioned as a redundant control measure. Process emissions were well controlled by this system with the exception of increased concentrations measured during the unloading the product. However, this emission source could be easily controlled through increasing cabinet ventilation. The identification and adoption of effective control technologies is an important first step in reducing the risk associated with worker exposure to engineered

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nanoparticles. Properly designing and evaluating the effectiveness of these controls is a key component in a comprehensive health and safety program.

Read more: Journal of Occupational and Environmental Hygiene Accepted author version posted online: 11 Jun 2014 (Available with AIHA membership)

Regulatory Research & Industrial Hygiene Professional News

AIHA

Emerging OEHS Government Policies Explored at AIHA Fall Conference

Injury and Illness Prevention Programs

Good for Workers. Good for Businesses. Good for America.

OSHA's proposed I2P2 rule, global cancer policy, and safety in the apparel industry among key topics to be addressed at AIHA October meeting in Washington, D.C.

Read more:

<https://www.aiha.org/about-aiha/Press/2014PressRelease/Pages/Emerging-OEHS-Government-Policies-Explored-at-AIHA-Fall-Conference-.aspx>

AIHA Comments to NIOSH Focus on E-cigarette Use in the Indoor Occupational Environment



AIHA recently submitted comments on the draft

NIOSH Current Intelligence Bulletin, Promoting Health and Preventing Disease and Injury through Workplace Tobacco

Policies. AIHA reviewed the draft document for its contribution to current knowledge on the potential health effects of electronic nicotine delivery systems (ENDS) such as e-cigarettes.

The AIHA E-Cigarette Project Team Working Group developed the comments, recommending that NIOSH either include e-

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cigarettes in the definition of smokeless tobacco or provide specific recommendations for the limitation of e-cigarette use in the indoor occupational environment. The group is also in the final stages of publishing a new white paper, "Electronic Cigarettes in the Indoor Environment."

Read more:

<https://www.aiha.org/publications-and-resources/TheSynergist/AIHANews/Pages/AIHA-Comments-to-NIOSH-Focus-on-E-cigarette-Use-in-the-Indoor-Occupational-Environment.aspx>

EPA

EPA Releases Three Final Chemical Risk Assessments / Agency Identifies Health Concern From Chemical Used In Paint Strippers

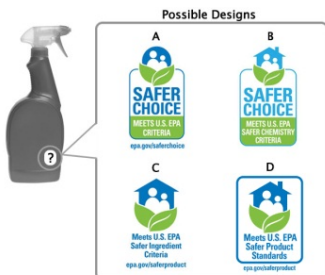
EPA is promulgating significant new use EPA released three final risk assessments for specific uses of three chemicals found in common household products. The risk assessment for Dichloromethane (DCM), which is widely used in paint stripping products, indicates health risks to both workers and consumers who use these products, and to bystanders in workplaces and residences where DCM is used. EPA estimates that more than 230,000 workers nationwide are directly exposed to DCM from DCM-containing paint strippers.



Read more:

<http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceeac8525735900400c27/9b8c8609521a27bc85257d420059da44!OpenDocument>

EPA Seeks Feedback from the Public on Proposed Label Options for Safer Products



The U.S. EPA is redesigning its Design for the Environment

Safer Product Label to better convey to consumers that products bearing the label meet the program's rigorous standard to be safer for people and the environment.

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Read more:

<http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceac8525735900400c27/43>

[67a2c4ae2362a885257d4d005d650a!Open Document](#)

BLS

BLS Reports Seven Percent Rise in Fatal Work Injuries among Latino Workers

While the total number of fatal work injuries fell from 4,628 to 4,405 in 2013, the number of work-related deaths among Hispanic or Latino workers rose by seven percent, according to preliminary results from the Bureau of Labor Statistics' (BLS) Census of Fatal Occupational Injuries (CFOI). The increase in fatal work injuries in this group—797 worker deaths—is the highest total since 2008.



Read more:

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/BLS-Reports-Seven-Percent-Rise-in->

[Fatal-Work-Injuries-among-Latino-Workers.aspx](#)

OSHA

OSHA, National Safety Council Renew Alliance to Address Worker Exposures to Falls, Emergency Response, Other Safety Issues



OSHA and National Safety Council renewed their alliance to work together to protect the health and safety of workers and understand the rights of workers and responsibilities of employers under the Occupational Safety and Health Act.

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Read more:

<https://www.osha.gov/pls/oshaweb/owadi>

[sp.show document?p_table=NEWS_RELEASES&p_id=26715](https://www.osha.gov/pls/oshaweb/owadi.sp.show_document?p_table=NEWS_RELEASES&p_id=26715)

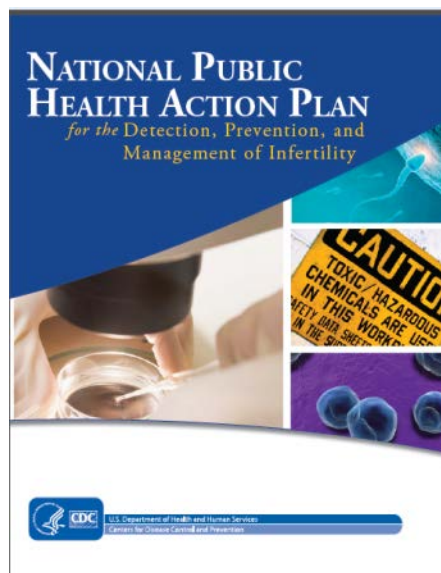
NIOSH

National Plan for Detection, Prevention, and Management of Infertility Released

On July 16, the CDC released the National Public Health Action Plan for the Detection, Prevention and Management of Infertility (<http://www.cdc.gov/reproductivehealth/Infertility/PublicHealth.htm>). This plan was created in consultation with many governmental and nongovernmental partners. NIOSH's contribution to this action plan is specifically related to reducing exposures to occupational agents that can harm reproductive health and fertility in women and men.

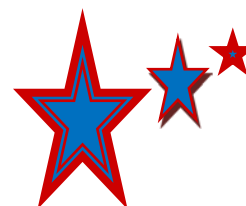
Read more:

<http://www.cdc.gov/niosh/eneews/eneewsV12N5.html#e>



USAPHC

How to become a DOEHRs-IH Super Star



- ✓ Do you feel like you use DOEHRs-IH more than other program offices?
- ✓ Do you feel unnoticed?
- ✓ Do you feel like you have done great IH things with DOEHRs-IH?
- ✓ Do you wear a unitard and cape under your clothes? (Don't answer this question please)

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Email the [Industrial Hygiene Training Coordinator](#) a brief synopsis about a new idea, a faster way, or a milestone you just met. Your Program Office just

may be nominated as the monthly DOEHS-IH **Super Star**.

Training

Free Training for Emergency Responders



FREE ONLINE TRAINING for the Emergency Responder Health Monitoring and Surveillance (ERHMS) System is now available and offers continuing education credits. For more information, please go to the NIOSH ERHMS web page at www.cdc.gov/niosh/topics/erhms

Read more:

<http://www.cdc.gov/niosh/eneews/eneewsV12N4.html#f>

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<http://phc.amedd.army.mil/topics/workplacehealth/ih/Pages/default.aspx>



USAPHC Training

Check out the USAPHC training website regularly. Many courses will become self-enrollment courses. Registration and course activation will begin in Blackboard from September 1- November 30, 2014.

To register, visit the Blackboard Learn website <http://aiph-dohs.elic.learn.army.mil>, log-in (use the AIPH-DOHS URL), click on the **Courses** tab (top left) and then under the **Course Catalog** tab choose the **AIPH-DOHS Courses** folder (top right). Under the **Browse Course Catalog** tab, type in a keyword to search for the course of interest. Hover the mouse cursor over the course name and a grey drop down will appear. Select **Enroll** and you have completed the self-enrollment process.

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